

Exercises Choose the letter of the term that best matches each figure.

1. **d**
 2. **h**
 3. **f**
 4. **e**
 5. **b**
 6. **g**

a. line
b. ray
c. complementary angles
d. midpoint
e. supplementary angles
f. perpendicular
g. point
h. line segment

Exercises Refer to the figure. See Example 1 on page 7.

7. Name a line that contains point I. **7. m, p, AT, TS, HS, FE, FI**
 8. Name a point that is not in lines n or p. **8. L**
 9. Name the intersection of lines n and m. **9. F**
 10. Name the plane containing points E, J, and L. **10. plane S or any 3 noncollinear pts plane E, J, L**

Draw and label a figure for each relationship. See Example 3 on pages 7-8.

11. Lines ℓ and m are coplanar and meet at point C. **11.**
 12. Points S, T, and U are collinear, but points S, T, U, and V are not. **12.**

Find the coordinates of the midpoint of a segment having the given endpoints.

25. $U(-6, -3), V(12, -7)$
 $M = \left(\frac{-6+12}{2}, \frac{-3+(-7)}{2} \right)$
 $M(3, -5)$

26. $P(2, 5), Q(-1, -1)$
 $M = \left(\frac{2+(-1)}{2}, \frac{5+(-1)}{2} \right)$
 $M(\frac{1}{2}, 2)$

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Exercises For Exercises 28-30, refer to the figure at the right. See Example 1 on page 30.

28. Name the vertex of $\angle 4$. **D**
 29. Name the sides of $\angle 1$. **FE, FD**
 30. Write another name for $\angle 3$. **LDEH, LHED**

In the figure, \overline{XW} bisects $\angle YXZ$ and \overline{XV} bisects $\angle YXW$. See Example 3 on page 32.

35. If $m\angle YXV = 3x$ and $m\angle VXW = 2x + 6$, find $m\angle YXW$.
 $3x = 2x + 6$
 $x = 6$
 $m\angle YXW = 2(3(6)) = 36^\circ$

36. If $m\angle YXW = 12x - 10$ and $m\angle WXZ = 8(x + 1)$, find $m\angle YXZ$.
 $12x - 10 = 8x + 8$
 $4x = 18$
 $x = 4.5$
 $12(4.5) - 10 = 44 \times 2 = 88^\circ = m\angle YXZ$

37. $7x - 9 = \frac{1}{2}(9x + 17)$
 $14x - 18 = 9x + 17$
 $5x = 35$
 $x = 7$
 $m\angle YXW = (2)(7) - 9 = 40^\circ$

Exercises For Exercises 38-41, use the figure at the right. See Examples 1 and 3 on pages 38 and 40.

39. Name a linear pair whose angles have vertex W. **TWZ, ZWX**
 40. If $m\angle TWZ = 2c + 36$, find c so that $\overline{TW} \perp \overline{WZ}$.
 $2c + 36 = 90$
 $2c = 54$
 $c = 27$

Exercises Name each polygon by its number of sides. Then classify it as convex or concave and regular or irregular. See Example 1 on page 46.

42. **quadrilateral, convex, regular**
 43. **not a polygon**
 44. **octagon, concave, irregular**

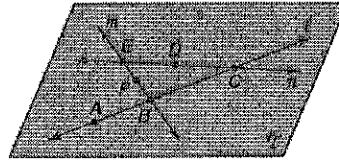
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Determine whether each statement is true or false.

1. A plane contains an infinite number of lines. **True**
2. If two angles are congruent, then their measures are equal. **True**
3. The sum of two complementary angles is 180. **False (90)**
4. Two angles that form a linear pair are supplementary. **True**

Skills and Applications

For Exercises 5-7, refer to the figure at the right.



5. Name the line that contains points B and F. **BF**
6. Name a point not contained in lines l or m .
7. Name the intersection of lines l and n .

Find the value of the variable and VW if V is between U and W.

8. $UV = 2$, $VW = 3x$, $UW = 29$
9. $UV = r$, $VW = 6r$, $UW = 42$
10. $UV = 4p - 3$, $VW = 5p$, $UW = 15$
11. $UV = 3c + 29$, $VW = -2c - 4$, $UW = -4c$

Find the distance between each pair of points.

12. $G(0, 0)$, $H(-3, 4)$
 13. $N(5, 2)$, $K(-2, 8)$
 14. $A(-4, -4)$, $W(-2, 2)$
- $GH = \sqrt{(3-0)^2 + (4-0)^2} = \sqrt{9+16} = \sqrt{25} = 5$
 $NK = \sqrt{(5-(-2))^2 + (2-8)^2} = \sqrt{49+36} = \sqrt{85}$
 $AW = \sqrt{(-4-(-2))^2 + (-4-2)^2} = \sqrt{4+36} = \sqrt{40} = 2\sqrt{10}$

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$UV = 2$
 $VW = 3x$
 $UW = 29$
 $2 + 3x = 29$
 $3x = 27$
 $x = 9$
 $VW = 27$

$UV = r$
 $VW = 6r$
 $UW = 42$
 $r + 6r = 42$
 $7r = 42$
 $r = 6$
 $VW = 36$

$UV = 3c + 29$
 $VW = -2c - 4$
 $UW = -4c$
 $3c + 29 - 2c - 4 = -4c$
 $c + 25 = -4c$
 $5c = -25$
 $c = -5$
 $VW = 6$

For Exercises 15-18, refer to the figure at the right.

15. Name the vertex of $\angle C$.
16. Name the sides of $\angle C$.
17. Write another name for $\angle C$.
18. Write another name for $\angle ADE$.



19. ALGEBRA The measures of two supplementary angles are $4r + 7$ and $r - 2$. Find the measures of the angles.
20. Two angles are complementary. One angle measures 26 degrees more than the other. Find the measures of the angles.

Find the perimeter of each polygon.

21. triangle PQR with vertices $P(-6, -3)$, $Q(1, -1)$, and $R(1, -5)$



$4r + 7 + r - 2 = 180$
 $5r + 5 = 180$
 $5r = 175$
 $r = 35$
 $4(35) + 7 = 147^\circ$
 35°

$x + y = 90$
 $x = y + 26$
 $y + 26 + y = 90$
 $2y = 64$
 $y = 32^\circ$
 $x = 58^\circ$

$PQ = \sqrt{(-6-1)^2 + (-3-(-1))^2} = \sqrt{49+4} = \sqrt{53}$
 $PQ = \sqrt{53}$
 $QR = \sqrt{(1-1)^2 + (-1-(-5))^2} = \sqrt{0+16} = 4$
 $QR = 4$
 $RP = \sqrt{(-6-1)^2 + (-3-(-5))^2} = \sqrt{49+4} = \sqrt{53}$
 $RP = \sqrt{53}$

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$Perimeter = \sqrt{53} + \sqrt{53} + 4$
 $4 + 2\sqrt{53} \approx 18.6 \text{ units}$